ABSTRACT

The present invention relates to methods and apparatuses for heat treatment of semiconductor films upon thermally susceptible non-conducting substrates at a minimum thermal budget are required, and more particularly, to a polycrystalline silicon thin-film transistors (poly-Si TFTs) and PN diodes on glass substrates for various applications of liquid crystal displays (LCDs), organic light emitting diodes (OLEDs), and solar cells. According to the methods and apparatus of the present invention, the semiconductor films can be heat-treated without damaging the thermally susceptible substrates: e.g., crystallization of amorphous silicon films at the minimum thermal budget acceptable for the use of glass, enhancing kinetics of dopant activation at the minimum thermal budget acceptable for the use of glass.